



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/750,549

12/31/2003

Sumeet Sandhu

42P17433

5586

59796

7590

04/08/2008

INTEL CORPORATION
c/o INTELLEVATE, LLC
P.O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER

PHU, PHUONG M

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

04/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/750,549	Applicant(s) SANDHU, SUMEET	
	Examiner Phuong Phu	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-15 and 17-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,11-15 and 17-27 is/are rejected.
- 7) ☒ Claim(s) 5-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/26/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 2/26/08. Accordingly, claims 1, 2, 5-15 and 17-27 are currently pending.

Claim Objections

2. Claim 13 is objected to because of the following informalities:

Claim 13 recites the limitation “one or more of converting dispersed content *from a time domain to a frequency domain*”. Based on illustration of (214, 216) shown in figure 2, it appears that the limitation should be changed --one or more of converting dispersed content from *a frequency domain to a time domain*”.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 11-15, 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kadous et al (7,167,684), newly-cited.

-Regarding claim 1, Kadous et al discloses a method (see figures 7) comprising:

procedure (710) of receiving content from a host device (708) for transmission via two or more tones “frequency subchannels” in a multicarrier communication (OFDM) channel from

Art Unit: 2611

transmit antenna(s) (724a,...,724t) (see col. 24, line 53 to col. 25, line 20, col. 27, lines 24-53);
and

procedure (comprising (720)) of distributing elements of the received content across the transmit antenna(s) and tone(s) for transmission at the transmit antennas at a transmit end and reception at receive antennas (752a,...,752r) at a receive end, wherein the distributing procedure introduces to introduce full-order transmit diversity (comprising a "PAP" scheme) by cyclically dispersing elements of the received content across M_t transmit antennas, ($M_t = N_T$), and a number (N) of multicarrier tones, ($N = N_F$ = number of "all frequency subchannels"), for each of a plurality of Rayleigh fading channel taps ($L = L$ taps"), wherein, therefore, equivalently it can be said here that the cyclical dispersion of the elements of the received content provides full-order transmit diversity according to $M_t * M_r * L$, where M_r is the number of receive antennas ($M_r = N_R$) (see col. 1, lines 58, col. 14, line 55 to col. 16, line 38, col. 27, lines 24-30).

-Regarding claim 2, Kadous et al discloses that the received content is a stream of quadrature amplitude modulation (QAM) symbols, received from the host device, or an application or agent (822a,...,822s) executing thereon (see figure 8, col. 26, lines 59-67).

-Regarding claim 11, Kadous et al discloses that the received content are complex symbols (x_1, \dots, x_{N_T}) that are linear or nonlinear combinations of input QAM symbols (see figure 8, col. 26, line 59 to col. 27, line 16).

-Regarding claim 12, Kadous et al discloses procedure (comprising (730)) of performing additional channel processing prior to transmission of the full-order transmit diversity channel from device (110a) to a remote device (150a) (see figure 7, col. 24, lines 53-55, col. 25, line 40 to col. 26, line 13).

-Regarding claim 13, Kadous et al discloses that additional channel processing comprising procedure of (730, 720) (see figure 7) of converting, via (826a,...,826t) (see figure 8), dispersed content from a frequency domain to a time domain, introducing, (via (828a,...828t) (see figure 8), a cyclical prefix into the signal stream, and performing, via (722a,...,722t) (see figure 8), front-end radio frequency (RF) processing prior to transmission via on or more of the transmit antenna(s) Mt (see col. 26, line 10 to col. 27, line 53).

-Regarding claim 14, Kadous et al discloses a storage medium (732) comprising content which, when executed by an accessing device, causes the device to implement the method (see figure 7, col. 30, lines 59-67).

-Regarding claim 15, as similarly applied to claims 1, 2, 12-14, set forth above and herein incorporated, Kadous et al discloses an apparatus (110a) (see figure 7) comprising:

a diversity agent (comprising (710)) , to receive content from a host device (708) and distribute elements of the received content across one or more of a plurality of transmit antenna(s) (724a,...,724t) and tone(s) of a multicarrier communication (OFDM) channel to generate a transmit signal exhibiting full- order transmit diversity, wherein the diversity agent cyclically disperses elements of the received content across Mt transmit antennas, and a number (N) of multicarrier tones for each of a plurality of Rayleigh fading channel taps (L) to provide the full-order diversity transmit signal; and

a transmitter (comprising (724a,...,724t)), responsive to the diversity agent, to transmit the generated transmit signal.

-Regarding claim 17, Kadous et al discloses that transmitter (see figure 8) comprising:

Art Unit: 2611

an inverse discrete Fourier transform (IDFT) element (826a,..826t), coupled to the diversity agent, to receive the transmit signal and convert it from a frequency domain to a time domain; and

a radio frequency (RF) processing element (722a,...,722t), coupled with the IDFT element, to transmit the generated transmit signal via a select one or more of a plurality Mt of transmit antennas.

-Regarding claim 18, Kadous et al discloses a memory ((732) to store content, at least a subset of which is executable content to implement a diversity agent; and control logic (730), coupled to the memory and the transmitter, to access and execute at least a subset of the content stored in the memory to implement the diversity agent (see figure 7, col. 30, lines 59-67).

-Regarding claim 19, Kadous et al discloses that the control logic is a processor (730), (considered here equivalent with the limitation “baseband processor”).

-Regarding claim 20, Kadous et al discloses that the control logic is a processor (730), (considered here equivalent with the limitation “application processor”).

-Regarding claim 21, Kadous et al discloses that the apparatus (110a) is a transceiver (see figure 7).

-Claim 22 is rejected with similar reasons set forth for claim 14.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2611

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadous et al.

-Regarding claim 23, as similarly applied to claims 1, 2, 12-15, 17-22, set forth above and herein incorporated, Kadous et al discloses a system (see figure 7) comprising:

two or more transmit antennas (724a,...,724t); and

a diversity agent (included in (710, 720)), to receive content from a host device (708) and distribute elements of the received content across one or more of the two or more antennas and tone(s) of a multicarrier communication channel to generate a transmit signal exhibiting full-order transmit diversity by cyclically dispersing elements of the received content across M_t transmit antennas, and a number (N) of multicarrier tones for each of a plurality of Rayleigh fading channel taps (L), wherein the cyclical dispersion of the elements of the received content provides full-order transmit diversity according to $M_t \cdot M_r \cdot L$, where M_r is the number of receive antennae.

Kadous et al does not teach that the two or more antennas are dipole antennas.

However, implementing antennas as dipole antennas is well-known in the art, and the examiner takes Official Notice.

Since Kadous et al does not teach in detail how the two or more antennas are implemented, it would have been obvious for one skilled in the art to implement Kadous et al

Art Unit: 2611

two or more antennas as dipole antennas so that the two or more antennas would be obtained as expected.

-Regarding claim 24, Kadous et al discloses a transmitter (comprising (222a,...,222t)), coupled between the diversity agent and the dipole antennas, to receive one or more substreams of cyclically distributed content from the diversity agent and complete channel processing prior to transmission of the transmit signal from the dipole antennas (see figure 8).

-Regarding claim 25, Kadous et al discloses that the transmitter (see figure 8) comprising:

an inverse discrete Fourier transform (IDFT) element (826a,...,826t), coupled to the diversity agent, to receive the one or more substreams of cyclically distributed content in a frequency domain and convert it to a time domain representation thereof (see col. 17, lines 35-50); and

a radio frequency (RF) processing element (222a,...,222t), coupled to the IDFT element, to receive the time domain representation of the cyclically distributed content and amplify it for transmission from the dipole antennae (see col. 25, lines 13-20).

-Regarding claim 26, Kadous et al discloses a cyclical prefix insertion element ((828a,...,828t), coupled between the IDFT element and the RF processing element, to introduce cyclical prefix into the time domain representation of the generated transmit signal (see figure 8).

-Regarding claim 27, Kadous et al discloses that the system is a transceiver (110a) (see figure 7).

Allowable Subject Matter

7. Claims 5-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed on 2/26/08 have been fully considered.

As results, the claim rejections, the objection to Specification, and the claim objections to claim 5 and 7, stated in the previous Office Action, have been withdrawn; and claims 5-10 are indicated allowable set forth above.

Claim objection to claim 13 is maintained and repeated since the applicant has not responded to this objection.

Claims 1, 2, 11-15 and 17-27 are deemed not allowable because of reasons set forth above in this Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 571-272-3009. The examiner can normally be reached on M-F (8:00 AM - 4:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong Phu
Primary Examiner
Art Unit 2611

/Phuong Phu/
Primary Examiner, Art Unit 2611